Complete Summary

TITLE

Selected infections due to medical care (area-level): rate per 100,000 population.

SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ)AHRQ Pub; 2007 Mar 12. 76 p.(AHRQ Pub; no. 03-R203).

AHRQ quality indicators. Patient safety indicators: technical specifications [version 3.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar 10. 107 p.

Measure Domain

PRIMARY MEASURE DOMAIN

Population Health

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the Measure Validity page.

SECONDARY MEASURE DOMAIN

Does not apply to this measure

Brief Abstract

DESCRIPTION

This measure is used to assess the number of cases of International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes 9993 or 99662 per 100,000 population.

RATIONALE

Hospitals in the United States provide the setting for some of life's most pivotal events - the birth of a child, major surgery, treatment for otherwise fatal illnesses. These hospitals house the most sophisticated medical technology in the world and provide state-of-the-art diagnostic and therapeutic services. But access to these services comes with certain costs. About 30% of personal health care

expenditures in the United States go towards hospital care, and the rate of growth in spending for hospital services has only recently leveled out after several years of increases following a half a decade of declining growth. Simultaneously, concerns about the quality of health care services have reached a crescendo with the Institute of Medicine's series of reports describing the problem of medical errors and the need for a complete restructuring of the health care system to improve the quality of care. Policymakers, employers, and consumers have made the quality of care in U.S. hospitals a top priority and have voiced the need to assess, monitor, track, and improve the quality of inpatient care.

Widespread consensus exists that health care organizations can reduce patient injuries by improving the environment for safety from implementing technical changes, such as electronic medical record systems, to improving staff awareness of patient safety risks. Clinical process interventions also have strong evidence for reducing the risk of adverse events related to a patient's exposure to hospital care. Patient Safety Indicators (PSIs), which are based on computerized hospital discharge abstracts from the AHRQ's Healthcare Cost and Utilization Project (HCUP), can be used to better prioritize and evaluate local and national initiatives. Analyses of these and similar inexpensive, readily available administrative data sets may provide a screen for potential medical errors and a method for monitoring trends over time.

The Selected Infections Due to Medical Care indicator is intended to flag cases of infection due to medical care, primarily those related to intravenous (IV) lines and catheters. This indicator is defined both on a provider level (by including cases based on a secondary diagnosis associated with the same hospitalization) and on an area level (by including all cases of such infection) (see the related National Quality Measures Clearinghouse [NQMC] summary of the Agency for Healthcare Research and Quality [AHRQ] indicator Selected infections due to medical care (provider-level): rate per 1,000 discharges). Patients with potentially immunocompromised states (e.g., AIDS, cancer, transplant) are excluded, as they may be more susceptible to such infection.

PRIMARY CLINICAL COMPONENT

Intravenous (IV) lines and catheters; infection

DENOMINATOR DESCRIPTION

Population of county or Metro Area associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

NUMERATOR DESCRIPTION

Discharges, 18 years and older or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium), with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of 999.3, 999.31, or 996.62 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs)

Exclude patients with any diagnosis code for immunocompromised state or cancer.

Note: Refer to the Technical Specifications document for specific ICD-9-CM codes and DRGs.

Evidence Supporting the Measure

EVIDENCE SUPPORTING THE VALUE OF MONITORING THE ASPECT OF POPULATION HEALTH

- A formal consensus procedure involving experts in relevant clinical, methodological, and organizational sciences
- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Evidence Supporting Need for the Measure

NEED FOR THE MEASURE

Monitoring health state(s)
Variation in health state(s)

EVIDENCE SUPPORTING NEED FOR THE MEASURE

AHRQ quality indicators. Guide to patient safety indicators [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ)AHRQ Pub; 2007 Mar 12. 76 p.(AHRQ Pub; no. 03-R203).

State of Use of the Measure

STATE OF USE

Current routine use

CURRENT USE

Federal health policymaking
Monitoring health state(s)
National reporting
State health policymaking

Application of Measure in its Current Use

CARE SETTING

Unspecified

PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Nurses
Physicians
Public Health Professionals

LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Counties or Cities

TARGET POPULATION AGE

- Age greater than or equal to 18 years
- Any age in Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium)

TARGET POPULATION GENDER

Either male or female

STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

Characteristics of the Primary Clinical Component

INCIDENCE/PREVALENCE

Unspecified

ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

BURDEN OF ILLNESS

Unspecified

UTILIZATION

Unspecified

COSTS

Unspecified

Institute of Medicine National Healthcare Quality Report Categories

IOM CARE NEED

Getting Better

IOM DOMAIN

Safety

Data Collection for the Measure

CASE FINDING

Both users and nonusers of care

DESCRIPTION OF CASE FINDING

Population of county or Metro Area associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

DENOMINATOR SAMPLING FRAME

Geographically defined

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions
Population of county or Metro Area associated with Federal Information Processing Standards (FIPS) code of patient's residence or hospital location

Exclusions
Unspecified

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are not equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Patient Characteristic

DENOMINATOR TIME WINDOW

Time window is a single point in time

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions
Discharges, 18 years and older or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium), with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code of 999.3, 999.31, or 996.62 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific Diagnosis-Related Groups (DRGs)

Exclusions
Exclude patients with any diagnosis code for immunocompromised state or cancer.

Note: Refer to the Technical Specifications document for specific ICD-9-CM codes and DRGs.

MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

NUMERATOR TIME WINDOW

Unspecified

DATA SOURCE

Administrative data
National public health data

LEVEL OF DETERMINATION OF QUALITY

Does not apply to this measure

TYPE OF HEALTH STATE

Adverse Health State

PRE-EXISTING INSTRUMENT USED

Unspecified

Computation of the Measure

SCORING

Rate

INTERPRETATION OF SCORE

A lower score is desirable

ALLOWANCE FOR PATIENT FACTORS

Unspecified

STANDARD OF COMPARISON

External comparison at a point in time
External comparison of time trends
Internal time comparison

Evaluation of Measure Properties

EXTENT OF MEASURE TESTING

The Patient Safety Indicators (PSIs) were evaluated by the project team using empirical analyses to explore the frequency and variation of the indicators, the potential bias, based on limited risk adjustment, and the relationship between indicators. The data sources used in the empirical analyses were the 1997 Florida State Inpatient Database (SID) for initial testing and development and the 1997 Healthcare Cost and Utilization Project (HCUP) State Inpatient Database for 19 States for the final empirical analyses.

All potential indicators were examined empirically by developing and conducting statistical tests for precision, bias, and relatedness of indicators. Three different estimates of hospital performance were calculated for each indicator:

1. The raw indicator rate was calculated using the number of adverse events in the numerator divided by the number of discharges in the population at risk by hospital.
2. The raw indicator was adjusted to account for differences among hospitals in age, gender, modified Diagnosis-Related Group (DRG), and comorbidities.
3. Multivariate signal extraction methods were applied to adjust for reliability by estimating the amount of "noise" (i.e., variation due to random error) relative to the amount of "signal" (i.e., systematic variation in hospital performance or reliability) for each indicator.

The project team constructed a set of statistical tests to examine the precision, bias, and relatedness of indicators for all accepted Provider-level Indicators, and precision and bias for all accepted Area-level Indicators. It should be noted that rates based on fewer than 30 cases in the numerator or the denominator are not reported.

The project team conducted a structured review of each indicator to evaluate the face validity (from a clinical perspective) of the indicators. The methodology for the structured review was adapted from the RAND/UCLA Appropriateness Method and consisted of an initial independent assessment of each indicator by clinician panelists using an initial questionnaire, a conference call among all panelists, followed by a final independent assessment by clinician panelists using the same questionnaire. The review sought to establish *consensual validity*, which "extends face validity from one expert to a panel of experts who examine and rate the appropriateness of each item..." The panel process served to refine definitions of some indicators, add new measures, and dismiss indicators with major concerns from further consideration.

Refer to the original measure documentation for additional details.

EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to patient safety indicators [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ)AHRQ Pub; 2007 Mar 12. 76 p.(AHRQ Pub; no. 03-R203).

Identifying Information

ORIGINAL TITLE

Selected infections due to medical care (area level definition) (PSI 23).

MEASURE COLLECTION

Agency for Healthcare Research and Quality (AHRQ) Quality Indicators

MEASURE SET NAME

Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators

DEVELOPER

Agency for Healthcare Research and Quality

FUNDING SOURCE(S)

Agency for Healthcare Research and Quality (AHRQ)

COMPOSITION OF THE GROUP THAT DEVELOPED THE MEASURE

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators are in the public domain and the specifications come from multiple sources, including the published and unpublished literature, users, researchers, and other organizations. AHRQ as an agency is responsible for the content of the indicators.

FINANCIAL DISCLOSURES/OTHER POTENTIAL CONFLICTS OF INTEREST

None

INCLUDED IN

National Healthcare Quality Report (NHQR)

ADAPTATION

This indicator was originally proposed by Iezzoni and colleagues (1994) as part of the Complications Screening Program (CSP) (CSP 11, "miscellaneous complications"). The University HealthSystem Consortium adopted the CSP indicator for major (#2933) and minor (#2961) surgery patients. A much narrower definition, including only 9993 ("other infection after infusion, injection, transfusion, vaccination") was proposed by Miller and colleagues (2001) in the

"Patient Safety Indicator Algorithms and Groupings." The American Nurses Association (1999) and its State associations have identified the number of laboratory-confirmed bacteremic episodes associated with central lines per critical care patient day as a "nursing-sensitive quality indicator for acute care settings."

RELEASE DATE

2003 Mar

REVISION DATE

2008 Mar

MEASURE STATUS

This is the current release of the measure.

This measure updates previous versions:

- AHRQ quality indicators. Guide to patient safety indicators [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 May 1. 78 p. (AHRQ Pub; no. 03-R203).
- AHRQ quality indicators. Patient safety indicators: technical specifications [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 107 p.

SOURCE(S)

AHRQ quality indicators. Guide to patient safety indicators [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ)AHRQ Pub; 2007 Mar 12. 76 p.(AHRQ Pub; no. 03-R203).

AHRQ quality indicators. Patient safety indicators: technical specifications [version 3.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar 10. 107 p.

MEASURE AVAILABILITY

The individual measure, "Selected Infections Due to Medical Care (Area Level Definition) (PSI 23)," is published in "AHRQ Quality Indicators. Guide to Patient Safety Indicators" and "AHRQ Quality Indicators. Patient Safety Indicators: Technical Specifications." These documents are available in Portable Document Format (PDF) from the Patient Safety Indicators Download page at the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.

For more information, please contact the QI Support Team at support@qualityindicators.ahrq.gov.

COMPANION DOCUMENTS

The following are available:

- AHRQ quality indicators. Patient safety indicators: software documentation [version 3.2] - SAS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar 10. 42 p. This document is available in Portable Document Format (PDF) from the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.
- AHRQ quality indicators. Software documentation: Windows [version 3.2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2008 Mar 10. 99 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- Patient safety indicators: covariates [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 27 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- Patient safety indicators: covariates (with POA) [version 3.1]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2007 Mar 12. 27 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- Remus D, Fraser I. Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- AHRQ summary statement on comparative hospital public reporting. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Dec. 1 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- Guidance for using the AHRQ quality indicators for public reporting or payment - appendix A: current uses of AHRQ quality indicators and considerations for hospital-level reporting. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Dec. A1-13 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- Guidance for using the AHRQ quality indicators for public reporting or payment - appendix B: public reporting evaluation framework--comparison of recommended evaluation criteria in five existing national frameworks. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2005 Dec. B1-4 p. This document is available in PDF from the AHRQ Quality Indicators Web site.
- UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. (Technical review; no. 4). This document is available in PDF from the AHRQ Quality Indicators Web site.
- HCUPnet. [internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 [accessed 2007 May 21]. [Various pagings]. HCUPnet is available from the AHRQ Web site. See the related QualityTools summary.

NQMC STATUS

This NQMC summary was completed by ECRI on October 1, 2003. The information was verified by the measure developer on October 29, 2003. This summary was updated by ECRI on February 7, 2005. The information was verified by the measure developer on April 25, 2005. This NQMC summary was updated again on February 9, 2006 and again on June 13, 2006. The information was verified by the

measure developer on July 31, 2006. This NQMC summary was updated by ECRI Institute on June 12, 2007 and again on November 10, 2008.

COPYRIGHT STATEMENT

No copyright restrictions apply.

Disclaimer

NQMC DISCLAIMER

The National Quality Measures Clearinghouse™ (NQMC) does not develop, produce, approve, or endorse the measures represented on this site.

All measures summarized by NQMC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public and private organizations, other government agencies, health care organizations or plans, individuals, and similar entities.

Measures represented on the NQMC Web site are submitted by measure developers, and are screened solely to determine that they meet the NQMC Inclusion Criteria which may be found at http://www.qualitymeasures.ahrq.gov/about/inclusion.aspx.

NQMC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or its reliability and/or validity of the quality measures and related materials represented on this site. The inclusion or hosting of measures in NQMC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding measure content are directed to contact the measure developer.

© 2009 National Quality Measures Clearinghouse

Date Modified: 2/9/2009